Detailed Business Requirement

COPD Acute Exacerbation Episode

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1. INTRODUCTION

1.1 Scope of this document

The Detailed Business Requirements (DBR) document serves as a guide to understand the definition of a COPD acute exacerbation episode (from here on referred to as "COPD episode"). The DBR addresses the following questions:

- Overview of the episode
  - **Typical patient journey**: What patient cases are addressed by the episode?
  - **Sources of value**: At which points in the patient journey do providers have most potential to improve quality of care and outcomes?
  - **Design dimensions**: What decisions underlie the design of the episode?
  - **Input data**: What inputs does the episode algorithm require to build the episode?
  - **Configuration**: What set of factors (e.g., ICD-9 codes, durations of time) need to be specified to define the episode?
  - **Outputs**: What are suggested outputs of an episode algorithm?

The section Design dimensions specifically addresses the following questions:

- **Trigger**: What events trigger an episode?
- **Episode duration**: What is the duration of the episode?

- **Claims included and excluded**: What claims are included in or excluded from the episode?
- **Total cost**: What is the total cost of an episode?
- **Quarterback**: Which provider is primarily held accountable for the outcomes of an episode?
- **Episode exclusions**: Which episodes are excluded from a Quarterback's average costs for the purposes of calculating any gain/risk sharing?
- **Quality metrics**: Which quality metrics need to be met for the Quarterback to be eligible for gain sharing?
- **Risk adjustment**: What approach can be taken to adjust episodes for risk factors that cannot be directly influenced by the Quarterback?
- **Gain/risk sharing**: What additional parameters define gain and risk sharing for Quarterbacks?

The DBR document does not cover the following topics:

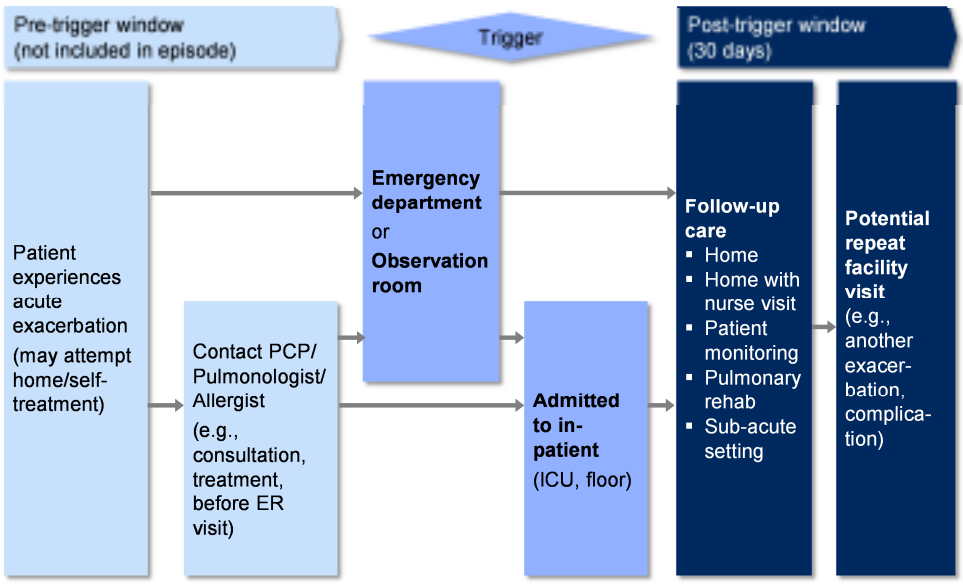
- Clinical rationale for inclusions and exclusions
- Intermediate analyses used during design of the episode
- Meeting materials used during design of the episode
- Guidance on data collection/transformation/storage
- Guidance on the episode algorithm coding approach
- Generation of risk adjustment coefficients
- Derivation of specific gain/risk sharing thresholds
- Generation and design of provider reports
- Background on how episodes compare to the current payment system

2. DESCRIPTION OF THE EPISODE

2.1 Typical patient journey

The episode described in this document pertains to COPD patients who develop a COPD acute exacerbation for which they are treated at a facility. As depicted in Exhibit 2, a COPD episode begins with an emergency department, observation room, and/or inpatient visit during which the acute symptoms of the COPD exacerbation, such as difficulty breathing, coughing, and shortness of breath, are treated. Following discharge from the hospital, the patient undergoes follow-up care which may include visits by a nurse, patient monitoring, pulmonary rehabilitation, and certain medications. Some patients may develop further COPD exacerbations within a short period of time requiring further treatment in a facility (repeat acute exacerbations).

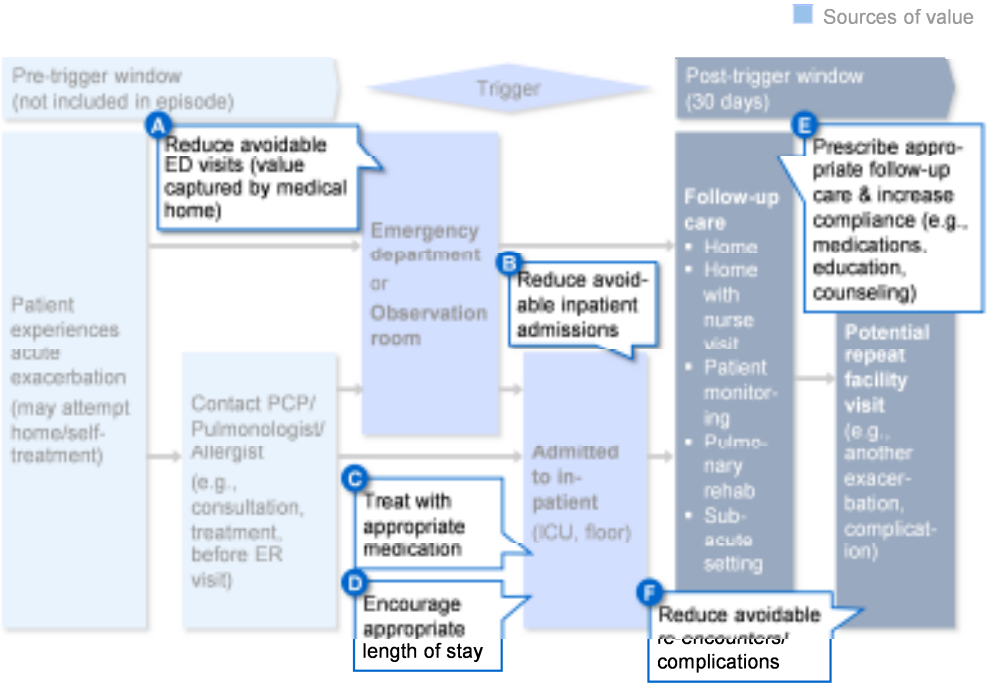
EXHIBIT 1 – TYPICAL PATIENT JOURNEY FOR THE COPD EPISODE



2.2 Sources of value

In treating COPD acute exacerbation patients, providers have several opportunities to improve the quality and cost of care (see Exhibit 3). For example, providers may be able to reduce avoidable inpatient admissions and ensure an appropriate length of stay in the case of an inpatient admission. Providers can also ensure appropriate follow-up care and educate patients on smoking cessation if applicable. In general, these practices could reduce the likelihood of avoidable re-admissions or repeat acute exacerbations and the overall cost of care for an acute exacerbation.

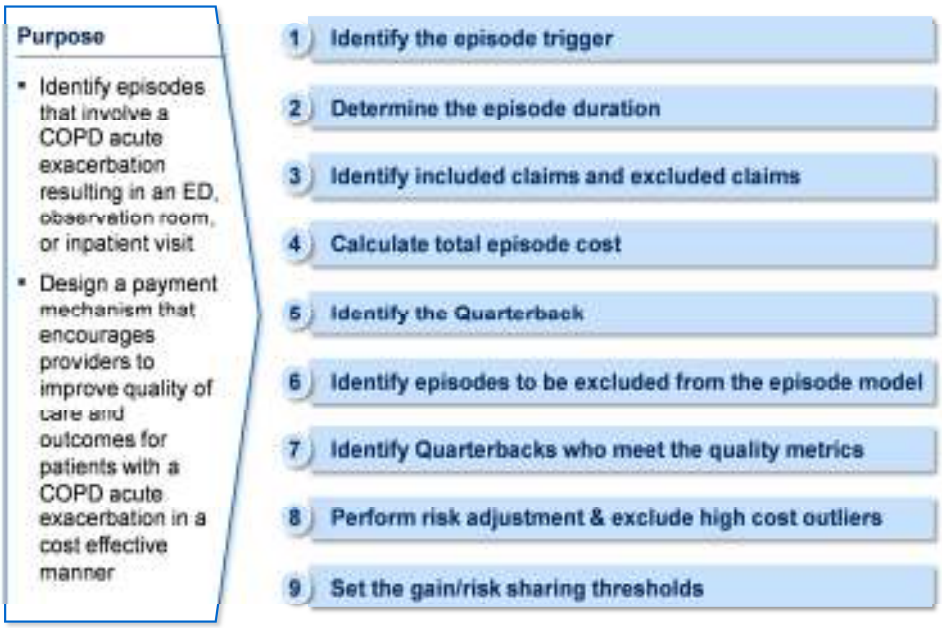
EXHIBIT 2 – SOURCES OF VALUE IN THE COPD EPISODE



2.3 Design dimensions

Designing and building a COPD episode comprises nine dimensions, as depicted in Exhibit 4.

EXHIBIT 3 – DESIGN DIMENSIONS OF THE COPD EPISODE



2.3.1 Trigger

The trigger for a COPD episode is an emergency department, observation room, or inpatient visit for an acute exacerbation of COPD. An ICD-9 diagnosis code indicating an acute exacerbation of COPD (see the attached file "Configuration" for the trigger ICD-9 codes and trigger exclusion used) is a potential trigger if the code is present in the primary diagnosis field of an emergency department, observation room, or inpatient facility claim. See the attached file "Configuration", tab "trigger locations" for the definition of emergency department, observation room, and inpatient for the purpose of

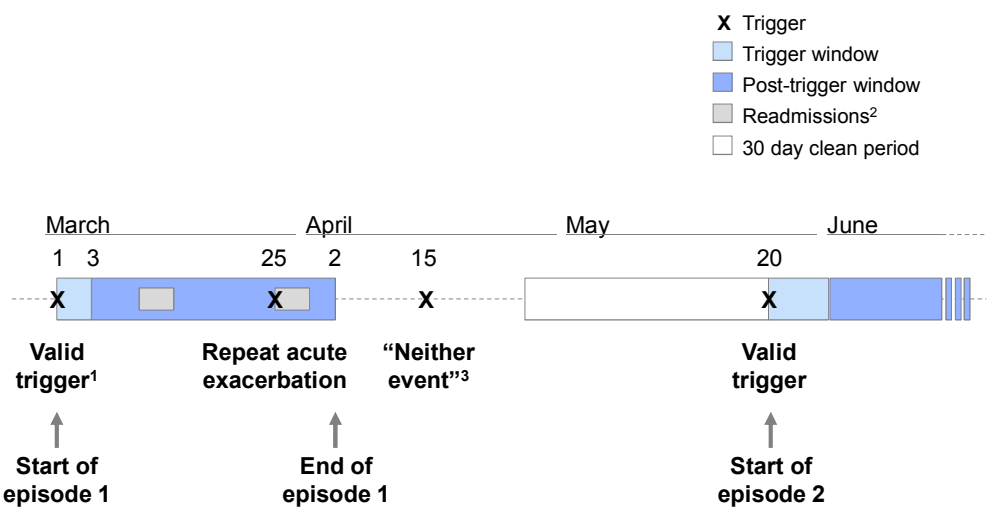
identifying triggers. Note that the trigger location “emergency department” and the claim type “emergency department” are not the same. For the definition of the claim types used later on in the COPD episode, please refer to the glossary.

A trigger code that occurs in a care setting other than emergency department, observation room, or inpatient as defined in the tab “trigger locations” in the attached file “Configuration” does not trigger an episode. Potential triggers identified using the trigger codes are divided into valid triggers, repeat acute exacerbations, and “neither events” using the approach described in the section “Episode duration”.

2.3.2 Episode duration

The duration of a COPD episode comprises the trigger window and the post-trigger window (see Exhibit 5).

EXHIBIT 4 – EPISODE DURATION



1 Assuming 30-day clean period precedes March 1. For details on episodes with transfers see Exhibit 6
2 Claims from an emergency department or inpatient visit within the 30-day post-trigger window are included in the episode unless excluded by the readmissions exclusion list. Readmissions may or may not have a trigger (i.e., may or may not be a repeat acute exacerbation). If a readmission is ongoing on the 30th day of the post-trigger window, the post-trigger window is extended until discharge from the readmission
3 Neither a repeat acute exacerbation (because not in post-trigger window) nor a valid trigger (because no 30-day clean period)

- **Pre-trigger window:** Not applicable to COPD episode.
- **Trigger window:**
  - Episodes without a transfer: The trigger window begins on the day of admission for the trigger COPD acute exacerbation and ends on the day of discharge from that admission.
  - Episodes with a transfer between facilities: The trigger window begins on the day of admission to the second facility for a trigger COPD acute exacerbation and ends on the day of discharge from the second facility (see Exhibit 6 for details on transfers and the sheet "transfer codes" in the file "Configuration" for the discharge status codes used). If there are multiple transfers between facilities, admission to the final receiving facility constitutes the start of the trigger window; discharge from the final receiving facility constitutes the end of the trigger window.
  - Episodes with a transfer within a facility: The trigger window begins on the day of admission for a trigger COPD acute exacerbation to the facility and ends with the final discharge from the facility, i.e., the trigger window extends across the entire stay at the facility, not just up to the discharge as a transfer.
- **Post-trigger window:** The post-trigger window begins the day after discharge and ends the 30th day (inclusive) after discharge. However, if an inpatient or emergency department visit (i.e., a readmission) that is included in the total episode cost extends beyond the post-trigger window (i.e., is ongoing on the 30th day of the post-trigger window) the post-trigger window is extended and ends on the day of discharge from the readmission. For the definition of which readmissions are included in the episode cost, see section 2.3.3. A potential trigger that occurs during the post-trigger window is a repeat acute exacerbation.

- **Clean period:** To be valid, the trigger must be preceded by a 30-day period without any claims that would normally trigger a COPD acute exacerbation episode. A potential trigger that is not preceded by a clean period and does not occur during a post-trigger window is a "neither event".

EXHIBIT 5 – DEFINITION OF TRANSFERS

Not transfers
Transfer between facilities
Transfer within facility

First facility discharges as transfer?	Second inpatient or ED visit within ≤ 2 days?	Trigger present at second facility?	Second facility admits as transfer?[1]	First and second facility have same tax ID?	What is the trigger window?	Who is the Quarter-back?
No	Yes or no	Yes or no	Yes or no	Yes or no	Admit to discharge facility 1	Facility 1
Yes	No	n/a	n/a	n/a	Admit to discharge facility 1	Facility 1
Yes	Yes	No	Yes or no	Yes or no	Admit to discharge facility 1	Facility 1
Yes	Yes	Yes	Yes or no	No	Admit to discharge facility 2	Facility 2
Yes	Yes	Yes	Yes or no	Yes	Admit to final discharge facility 1 = 2	Facility 1 = facility 2

1 The criterion whether the second facility admits as transfer is listed for completeness sake. In identifying transfers, it does not matter whether the second facility admits as a transfer or not

2.3.3 Claims included and claims excluded

The total episode cost is based on claims directly related to or stemming from the acute exacerbation of COPD. It includes costs arising from the claim types inpatient, emergency department, outpatient, professional, and pharmacy. See the glossary for the definition of the claim types.

- **Pre-trigger window:** Not applicable because there is no pre-trigger window.
- **Trigger window:** All claims (inpatient, emergency department, outpatient, professional, and pharmacy) are included. Note that in the case of a transfer between facilities the trigger window begins with admission to the receiving facility which means that claims from the first admit facility are not included in the episode.
- **Post-trigger window:** During the post-trigger window the following sequence is applied to determine which claims count towards the total cost of the episode:
  - 1. Scan inpatient claims for readmission exclusion codes (see the file "Configuration" for a list of the readmission exclusion codes):
    - If an inpatient claim contains a readmission exclusion code, exclude the inpatient claim and all ED, outpatient, professional, and pharmacy claims that occur during the time window of the inpatient stay. If two inpatient claims occur on the same day, only one of them needs to contain a readmission exclusion code for an exclusion to occur.
    - If an inpatient claim does not contain a readmission exclusion code, include the inpatient claim and all ED, outpatient, professional, and pharmacy claims that occur during the time window of the inpatient stay.
  - 2. Scan ED claims that have not been addressed under 1 (i.e., that do not overlap with an inpatient stay) for readmission exclusion codes:
    - If an ED claim contains a readmission exclusion code, exclude the ED claim and all outpatient, professional, and pharmacy claims that occur during the time window of the ED stay. If two ED claims occur on the same day (e.g., a UB-04 and a

CMS1500 ED claim), only one of them needs to contain a readmission exclusion code for an exclusion to occur.

    - If an ED claim does not contain a readmission exclusion code, include the ED claim and all outpatient, professional, and pharmacy claims that occur during the time window of the ED claim.

- 3. Scan outpatient, professional, and pharmacy claims that have not been addressed by 1 or 2 (i.e., that do not overlap with an inpatient or ED visit) for claims inclusion codes (see the file "Configuration" for a list of the claims inclusion codes):
    - If an outpatient, professional, or pharmacy claim contains an inclusion code, include the detailed line with the inclusion code (in the case of a procedure and drug inclusion code) or the entire claim (in the case of a diagnosis inclusion code).
    - If an outpatient, professional, or pharmacy claim does not contain an inclusion code, exclude the detailed line with the inclusion code (in the case of a procedure and drug inclusion code) or the entire claim (in the case of a diagnosis inclusion code).

Exhibit 7 shows a schematic of the sequence of claims inclusions and exclusions during the post-trigger window.

EXHIBIT 6 – CLAIMS INCLUDED AND EXCLUDED DURING THE POST-TRIGGER WINDOW

1. Inpatient claim

Contains code from the list "readmission exclusions"?	Inpatient claim	Concurrent ED, outpatient, professional, or pharmacy claims
Yes	Entire claim excluded[1]	Entire claim excluded
No	Entire claim included	Entire claim included

2. ED claim not concurrent with inpatient claim

Contains code from the list "readmission exclusions"?	ED claim	Concurrent outpatient, professional, or pharmacy claims
Yes	Entire claim excluded[1]	Entire claim excluded
No	Entire claim included	Entire claim included

3. Outpatient, professional, or pharmacy claim not concurrent with inpatient or ED claim

Contains code from a list "claims included xxx"?	If procedure or drug code…	If diagnosis code…
Yes	Claim line included	Entire claim included
No	Claim line excluded	Entire claim excluded

1 If two ED claims or two inpatient claims occur on the same day, only one of them needs to contain a readmission exclusion code for an exclusion to occur

2.3.4 Total cost

The total episode cost is the sum of the amount that reflects that totality of costs for claims included in the episode. The field that reflects the totality of costs is the lesser of allowed amount or paid amount plus member cost share.

Breakdowns of total episode cost by claim type (inpatient, emergency department, outpatient, professional, and pharmacy) or by time window in the episode (trigger, post-trigger) may be included for further analysis of the outputs and/or for reporting to providers as applicable. Guidance on how to define care categories in the provider reporting is included within the configuration file.

2.3.5 Quarterback

The Quarterback is the provider deemed to have the greatest accountability for the quality and cost of care for a patient with a COPD acute exacerbation.

- **Episodes without a transfer:** For the state, the Quarterback is the facility of the trigger claim.
- **Episodes with a transfer between facilities:** For the state, the Quarterback is the second facility where the patient with the acute exacerbation is transferred to and where the second trigger claim occurs. (If there are multiple transfers the Quarterback is the final receiving facility).
- **Episodes with a transfer within a facility:** For the state, the Quarterback is the facility of the trigger claim (which in this case is the same facility as the facility to where the patient is transferred and where the second trigger claim occurs).

2.3.6 Episode exclusions

Episode exclusions ensure that the remaining episodes are comparable to each other and allow fair comparisons between patient panels. The exclusions applied for COPD episodes are:

- **Age**: Younger than (<) 18 or older than (>) 64. Age is determined using the year and month of the claim and the year and month of birth.
- **Comorbidities**: An episode is excluded if the patient has a comorbidity code in any diagnosis fields or in a detailed claim line during the specified time period. All claims should be scanned for comorbidities with the exception of DME, laboratory and transportation claims. See the attached file “Configuration” for a list

of codes that lead to exclusion of an episode. Examples of excluded episodes are those where the patient received a code for:

- Intubation during the episode
- Tracheostomy during the episode or in prior year
- Cystic fibrosis during the episode or in prior year
- Pulmonary hypertension during the episode or in prior year
- Bronchiectasis during the episode or in prior year
- Lung cancer during the episode or in prior year
- Paralytic syndromes or infantile cerebral palsy during the episode or in prior year
- End stage renal disease during the episode or in prior year
- Active cancer management
- HIV/AIDS
- Multiple Sclerosis
- Blood clotting disorders such as hemophilia

If a patient was not continuously enrolled during the year prior to the episode, comorbidities are checked in the data that are available. Lack of continuous enrollment during the prior year does not lead to exclusion of an episode.

- **General exclusions**: Some exclusions apply to any type of episode, i.e., are not specific to COPD acute exacerbation. An episode is excluded when:
  - A patient has dual coverage of primary medical services at any moment during the episode
  - A patient has inconsistent enrollment (i.e., not continuously enrolled) at any moment during the episode
  - The patient dies in the hospital during the episode

- The patient has a discharge status of “left against medical advice” on any facility claim during the episode
- The episode trigger occurs in a Federally Qualified Health Center (FQHC) or a Rural Health Clinic (RHC)
- Third-party liability charges are present on any line of any claim within an episode, indicating that more than one payer was involved in reimbursing the claim(s)
- Incomplete data, miscoding, or incomplete claims during the episode. Incomplete episodes are defined as lowest 2.5% of all non-risk adjusted episodes by trigger location (ED, observation and inpatient).

2.3.7 Quality metrics

A Quarterback must meet all quality metrics tied to gain sharing in order for the Quarterback to be eligible for gain sharing. In addition, Quarterbacks may receive information on additional quality metrics that allow them to assess their performance, but that do not affect their eligibility to participate in gain sharing. Quality metrics are calculated on a per Quarterback basis across all of the Quarterback’s valid episodes. They are based on information contained in the claims filed during an episode. Failure to meet all quality metrics tied to gain sharing will eliminate a Quarterback from gain sharing for the performance period in question. Risk sharing is not dependent on the Quarterback meeting any quality metrics.

- **Quality metrics tied to gain sharing:**
  - Percent of episodes where the patient visits a physician or other practitioner during the post-trigger window. See the attached file “Configuration”, tab “quality metric” for CPT codes used to identify relevant professional claims.

- **Quality metrics not tied to gain sharing (i.e., included for information only):**
  - Percent of patients with repeat acute exacerbation during the post-trigger window. Repeat acute exacerbations with a readmission exclusion are not taken into account.
  - Percent of episodes where the acute exacerbation during the trigger window is treated in an inpatient setting (as percent of all episodes).
  - Percent of cases where smoking cessation counseling for the patient and/or family was offered (where applicable).

2.3.8 Risk adjustment

For the purposes of determining a Quarterback's performance, the average episode cost attributable to the Quarterback is adjusted to reflect risk and/or severity factors captured in recent claims data in order to be fair to providers with high-risk patients, to avoid any incentive for adverse selection of patients, and to encourage high-quality, efficient care.

2.3.9 Payment thresholds for gain/risk sharing

Gain/risk sharing is determined based on the comparison of the average risk adjusted episode cost of each Quarterback to a pre-determined set of thresholds. The decision criteria for setting the thresholds are beyond the scope of this document. Note that there is no requirement for a minimum number of episodes a provider needs to treat in order to be included in gain/risk sharing.

2.4 Input data

To build the COPD episode, four categories of input data are needed:

- **Medical claims**: Raw institutional claims (UB-04 claim form) and professional claims (CMS1500 claim form) at the patient level.
- **Pharmacy claims**: Raw pharmacy claims (NCPDP claim form) at the patient level.
- **Provider information**: Full list of providers in the geography where episodes are implemented. The list should contain at a minimum provider ID, name, address and tax id.
- **Beneficiary enrollment information**: The full list of patients and their health insurance program eligibility and enrollment information.

While preparing the input data for an episode, the following questions need to be addressed:

- Is the input data quality and completeness the same for all years?
- Were there any changes over the reporting / performance time period? Potential changes may include:
  - Types of claims reported
  - Reporting procedures
  - Reporting entities (e.g. change from Fee-for-Service to Managed Care)
  - The way claims were recorded or formatted

  - Policy changes that impacted eligibility or enrollment and therefore the composition of the population on which the claims data are based

- How often are the medical claims, pharmacy claims, provider information, enrollment, and eligibility data sets refreshed? How will the updated data be incorporated into the episode analyses?

2.5 Configuration

The details of which codes trigger an episode, which claims are included in an episode, etc., are captured in the attached "Configuration" file. The file includes:

- **Trigger diagnoses**: Codes that indicate an acute exacerbation of COPD. Trigger codes are provided as ICD-9 diagnosis codes.
- **Trigger locations**: Definition of the care settings where a trigger diagnosis has to occur to constitute a potential episode trigger.
- **Claims included**: Codes that are used to identify professional, outpatient, and pharmacy claims in the post-trigger window that are bundled into the episode. Separate lists of codes are provided for professional and outpatient diagnoses (ICD-9 diagnosis), laboratory and radiology procedures (ICD-9 procedure, CPT, HCPCS), durable medical equipment (HCPCS), and pharmacy (HIC3).
- **Readmission exclusions**: Codes that are used to identify readmissions during the post-trigger window that are excluded from the episode. The format is ICD-9 procedures and CPT. The codes are derived from the MS-DRG based readmission exclusion lists published by the Centers for Medicare and Medicaid Services for the Bundled Payments for Care Improvement (BPCI) Initiative.

- **Episode exclusions**: Codes indicating comorbidities or other reasons for exclusion of an episode from gain/risk sharing. The format is revenue code, CPT, HCPCS, ICD-9 diagnosis, or ICD-9 procedure.
- **Quality metrics**: Codes used to assess the performance of Quarterbacks on the quality metrics. The format is CPT.

2.6 Outputs

Using the input data tables, an episode algorithm will create a bundled account of all claims relating to COPD episodes. A suggested output of an episode algorithm consists of four tables:

- **Episode output table**: Contains one episode per row with information such as total cost, start/end date, Quarterback, patient ID. Multiple episodes of the same patient in the performance period appear as separate rows.
- **Claims output table**: Contains the complete set of claims (medical and pharmacy) that were bundled to create the episode table. Each claim has an episode identifier that will allow the user to link the claims to their corresponding episode.
- **Quarterback output table:** Contains one row for each Quarterback (identified by tax id) with information such as the average total episode cost, performance on quality metrics, number of episodes, etc. Additional information such as Quarterback name and address are also included.
- **Testing table:** Contains a set of metrics for quality control and validation of episode outputs.

3. RESOURCES AND VALIDATION

3.1 Attachments

Accompanying the Detailed Business Requirements document is the attachment:

- Detailed Business Requirements COPD Configuration v1.3.2 rev 01.xlsx

3.2 Glossary

- Claim types used in the COPD episode

Claim type	Claim Form	Definition
Inpatient	UB-04	Bill types: 11X, 12X, 18X, 41X, 86X
Emergency department	UB-04	Bill types: 13X, 14X, 22X, 23X, 73X-77X, 79X, 83X-85X and (revenue codes = 0450, 0451, 0452, 0456, 0459, 0760, 0761, 0762, 0769 or CPT code = 99281, 99282, 99283, 99284, 99285, 99291, 99292)
	CMS-1500	Place of service = 23 or CPT code = 99281, 99282, 99283, 99284, 99285, 99291, 99292
Outpatient	UB-04	Bill types: 13X, 14X, 22X, 23X, 71X-77X, 79X, 83X-85X and any other revenue codes and CPT codes than those listed for emergency department
Professional	CMS-1500	All ICD-9 Dx, CPT, and HCPCS
Pharmacy	NCPDP	All NDC

- CPT: Current Procedural Terminology
- Dx: Medical diagnosis
- HCPCS: Healthcare Common Procedure Coding System
- HIC: Hierarchical Ingredient Code
- ICD-9: International Classification of Diseases, Ninth Revision

- NDC: National Drug Code
- NPI: National Physician Identifier
- Px: Medical procedure
- Rx: Medical prescription
- Tax ID: Federal tax identification number